

Can machine learning detect faults of smart grids?

In this paper, a reliable machine learning technique is proposed to detect and classify different faults of smart grids. The proposed technique benefits from the principal component analysis (PCA) and linear discriminant analysis (LDA). The PCA is used to reduce the size of the dataset matrices.

How to classify faults in a smart grid?

A classification technique based on the conventional K-NN algorithm is proposed to detect and classify different types of fault in a smart grid. In the proposed technique, the PCA method is used to decrease the dataset size while LDA provides online classification before applying the K-NN.

Can computational intelligence detect islanding phenomenon in smart distributed grids?

The importance of computational intelligence to detect islanding phenomenon in smart distributed grids, , , . Those works present a probabilistic Neural Network (NN) and Support Vector Machine (SVM) as powerful self-adapted machine learning techniques for fault detection.

Can LDA be used to classify faults in a smart grid?

Table 3 LDA base-line: performance of the KNN classification algorithm when LDA is the only instrument for feature reduction A classification technique based on the conventional K-NN algorithm is proposed to detect and classify different types of fault in a smart grid.

Can KNN detect faults in a smart grid?

In this paper, the KNN technique augmented with principal component analysis (PCA) and linear discriminant analysis (LDA) is used to detect and classify different faults in a smart grid.

Which method is used in fault detection & diagnosis of power grids?

Fuzzy logic (FL) and genetic algorithm (GA) are two widely used methods used in fault detection and diagnosis of the power grids. Fuzzification in different membership function has a determinative role to increase the precision of the FL controller.

A brief summary of faults in smart grid infrastructure is provided by Hlalele et al. (2019). They distinguish between faults related to power distribution, photovoltaic and ... The authors provide 65 faults detection and location approaches that were discussed Table 1 Related works Year Article Focus Results 2021 Sarathkumar et al. (2021) Faults ...

This article proposes a deep learning (DL) model made of Long Short Term Memory (LSTM) and Adaptive Neuro Fuzzy Inference System (ANFIS) to detect fault in smart distribution grid assisted by...

ABSTRACT Fault detection and location give to smart grid the ability to self-healing and isolating the fault in

order to limit the negative consequences. In the literature, several techniques are proposed for detection and classification of faults using artificial intelligence algorithms. This paper proposes a novel method using fuzzy logic and neural networks for ...

the smart grid and smart grid fault detection. A. Overview of Smart Grid and Fault Detection The key components of smart grid system is shown in Fig.1. From the perspectives of power transmission, power distribution and power consumption, autonomous smart grid fault detection is needed. 1) Power Transmission: As UHV AC and DC transmis-

A fault detection, identification, and location approach is proposed and studied in this paper. This approach is based on matching pursuit decomposition (MPD) using Gaussian atom dictionary, hidden Markov model (HMM) of real-time frequency and voltage variation features, and fault contour maps generated by machine learning algorithms in smart grid (SG) systems. ...

Section 5 aggregates concepts and procedures associated with the SG faults detection and location in the Smart City context. Next, Section 6 describe lessons learned and future research directions in FD/L-SG. Finally, Section 7 offers the main conclusions. ... Smart grid fault detection using locally optimum unknown or estimated direction ...

IEEE TRANSACTIONS ON SMART GRID, VOL. 5, NO. 6, NOVEMBER 2014 2947 Fault Detection, Identification, and Location in Smart Grid Based on Data-Driven Computational Methods Huaiguang Jiang, Student Member, IEEE, Jun J. Zhang, Senior Member, IEEE, Wenzhong Gao, Senior Member, IEEE, and Ziping Wu, Student Member, IEEE Abstract--A ...

Enabling Efficient Integration Of Electric Vehicles In Qatar's Smart Grid: Planning, Operation, And Cybersecurity ... On-Line Continuous Monitoring, Detection, and Location of Partial Discharge and Dynamic Aging in Medium and High Voltage Electrical Insulation (NPRP10-0101-170085) ... Condition Monitoring and Fault Diagnosis of Electric ...

1.2 . Figure 1.1. Grid Fault Taxonomy. Traditional fault detection (basic over-current detection) and analysis are performed from measurements mostly made at the substation and in some systems, with pole-top devices such as smart switches and

make fault detection and location more reliable and reduce the danger for grid customers. Figure 1: RMS voltage in grid with intermittent earth fault III. MEASUREMENT INFRASTRUCTURE Real-time monitoring schemes requires high-resolution measurements that are reported with a low time delay (latency) to a centralized computing unit.

This survey presents a structured review of the existing research into some common AI techniques applied to load forecasting, power grid stability assessment, faults detection, and security ...

Qatar fault detection in smart grid

Smart 3-R Gas Detector - For Flammable, Toxic & Oxygen Detection; Smart 3-R Lite Gas Detector - Refrigerant Detection; Multi-Colour LED Ring provides aesthetic visual indication. Available with a variety of gas sensors & detection. 4-20mA Analog Signal - Integration with Gas Panel / PLC. Contact us for more information.

Effective fault detection, classification, and localization are vital for smart grid self-healing and fault mitigation. Deep learning has the capability to autonomously extract fault characteristics and discern fault categories from the three-phase raw of voltage and current signals. With the rise of distributed generators, conventional relaying devices face challenges ...

Development of smart fault diagnosis models (detection, classification, and either location or section identification) employing feedforward neural networks. ... Smart grid fault diagnosis under load and renewable energy uncertainty. Power Syst Fault Diagn (2022), pp. 293-346, ... Saudi Arabia, and Qatar. Environ Prog Sustain Energy, 36 (4 ...

Request PDF | Faults in smart grid systems: Monitoring, detection and classification | Smart Grid (SG) is a multidisciplinary concept related to the power system update and improvement. SG implies ...

The different parts of the understudy smart grid as a sample network and the considered fault is discussed in the next section. The third section of the paper explains the proposed algorithm with details. And at the last section, a comprehensive study is done on different faults of the smart grid to prove the acceptable performance of the system.

Real-time smart grid monitoring is critical to enhancing resiliency and operational efficiency of power equipment. Cloud-based and edge-based fault detection systems integrating deep learning have been proposed recently to monitor the grid in real time. ...

Recently, anomaly detection of the smart grid has attracted a large amount of interest from researchers, and it is widely applied in a number of high-impact fields. One of the most significant challenges within the smart grid is the implementation of efficient anomaly detection for multiple forms of aberrant behaviors.

Crowcon Detection Instruments, United Kingdom - For Fixed & Portable Gas Detector - Represented by Crowngas Detection System - Doha, Qatar. ... Smart 3-R Gas Detector - For Flammable, Toxic & Oxygen Detection; Smart 3-R Lite Gas Detector - Refrigerant Detection; ... Each detector assigned 1 Fault Level & 3 Alarm Levels to trigger up-to 32 ...

Fault detection and location give to smart grid the ability to self-healing and isolating the fault in order to limit the negative consequences. In the literature, several techniques are proposed ...

In this paper, the KNN technique augmented with principal component analysis (PCA) and linear discriminant analysis (LDA) is used to detect and classify different faults in a smart grid. In the first stage of the ...

Qatar fault detection in smart grid

This manuscript addresses the critical challenge of fault classification and localization within smart distribution networks, exacerbated by the complex integration of distributed energy resources and the dynamic nature of modern power systems. Traditional methods fall short in accurately and efficiently managing these tasks due to their reliance on ...

Distributed energy generation increases the need for smart grid monitoring, protection, and control. Localization, classification, and fault detection are essential for addressing any problems immediately and resuming the smart grid as soon as possible. Simultaneously, the capacity to swiftly identify smart grid issues utilizing sensor data and easily accessible ...

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